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NORTH AMERICAN BEES OF THE GENUS *NOMADA*.

BY T. D. A. COCKERELL.

*Nomada superba*, Cresson, var. *α*.

♂.—Smaller (about 10 mm. long); basal nervure meeting transverso-medial, but on the basad side; lateral face-marks truncate above, but sending beyond a fine line to top of eye; lower part of posterior orbits with a yellow stripe.

*Hab.*—Cheyenne, Wyoming, June 15 (collection C. V. Riley); one in U. S. National Museum. If the characters are constant in the locality (which is quite a new one for the species) this may be a valid subspecies.

The following species more or less resemble *Nomada luteola*, and may be conveniently treated together:

*Males.*

All have scape yellow in front; mesothorax black; abdomen with yellow bands, that on second segment entire or interrupted by a line only.

1. Scutellum all black; tegulae testaceous; supraclypeal mark absent; flagellum bright ferruginous beneath, not denticulate; band on first segment broadly interrupted; bands on second and third with a linear interruption, . . . . . *dentariae*, Rob.

Scutellum yellow or spotted with yellow, . . . . . 2.

2. Transverse medial nervure a little basad of basal; third antennal joint not over (rather less than) half length of fourth; postscutellum and metathorax wholly black (California),

*sanctæcrucis*, Ckll.

Basal nervure meeting transverso-medial; postscutellum largely or wholly yellow, . . . . . 3.

Basal nervure ending distinctly (often greatly) basad of transverse medial, . . . . . 5.

3. Metathorax all black, scape very stout (Washington State),

*pascoensis*, Ckll.

Metathorax with much yellow; face narrow, facial quadrangle longer than broad, not narrowed below, . . . . . 4.

4. Mesothorax wholly black; apex of abdomen entire . . . *vincta*, Say.

Mesothorax with lateral margins yellow; apex of abdomen very faintly notched, . . . . . *zebrata*, Cress.

5. Legs red; metathorax with four pale spots; apex of abdomen notched, . . . . . *elrodi*, Ckll.  
Legs yellow and black, sometimes with red suffusion, especially toward base, . . . . . 6.
6. Apex of abdomen entire; the red on legs preponderating, *affabilis*, Cress.  
Apex of abdomen notched, though sometimes obscurely; legs with less red, if any, . . . . . 7.
7. Pleura with a large transverse yellow patch, . . . . . 8.  
Pleura with a smaller yellow mark, below tubercles, . . . . . 9.
8. The yellow patch almost divided in the middle; scutellum and lateral margins of mesothorax yellow, . . . *sulphurata*, Smith.  
The yellow patch not so; scutellum with two yellow spots; mesothorax all black, . . . . . *rivalis*, Cress.
9. Lateral face-marks not going above level of antennæ; small yellow spots on scutellum and metathorax (Europe), . . *succincta*, Panz.  
Lateral face-marks continued narrowly to top of eye, . . . 10.
10. Eyes conspicuously diverging above; flagellum not denticulate; tibiæ yellow with a black spot behind, . . . *civilis*, Cress.  
Eyes not or hardly diverging above; orbits yellow except at summit behind, . . . . . 11.
11. Flagellum denticulate beneath; anterior tibiæ wholly yellow; yellow band on first abdominal segment interrupted, *luteoloides*, Rob.  
Flagellum not or obscurely denticulate beneath; third antennal joint little shorter than fourth; anterior tibiæ with a black mark behind; band on first abdominal segment entire, or reddish in middle, . . . . . *luteola*, Lep.

*Females.*

1. Third antennal joint longer than fourth; basal nervure hardly or not far basad of transverse medial, . . . . . 2.  
Third and fourth joints subequal, or third shorter than fourth, . . 6.
2. Mesothorax red; front red, no yellow spot in front of middle ocellus; legs red; basal nervure almost meeting transverse medial, . . . . . *zebrata*, Cress.  
Mesothorax red and black, . . . . . *vincta*, Say, var.  
Mesothorax black, . . . . . 3.
3. Legs red; third submarginal cell narrow, *vincta*, Say (also *zebrata*, var.).  
Legs yellow and black; a yellow spot in front of middle ocellus; posterior orbits yellow, . . . . . 4.
4. Legs red basally; mesothorax all black, *xanthophila*, Ckll., var. *pecosensis*, Ckll.  
Legs not red basally; mesothorax yellow at sides, or with a yellow spot on each side, . . . . . 5.
5. Mesothorax with two yellow stripes on disk, . . *edwardsii*, Cress.  
Mesothorax without yellow stripes on disk, . *edwardsii*, Cress., var.

6. Posterior orbital margin black (Europe), . . . *succincta*, Panz.  
Posterior orbital margin broadly yellow, . . . . . 7.
7. Mesothorax red without yellow stripes; legs red and yellow, . . . . . 8.  
Mesothorax red with yellow stripes, . . . . . 10.  
Mesothorax black, with or without stripes, . . . . . 11.
8. Third submarginal cell short; basal nervure considerably basad  
of transverso-medial, . . . . . 9.  
Third submarginal cell long; basal nervure almost meeting trans-  
verso-medial, . . . . . *citrina*, Cress., var. *rufula*, Ckll.
9. Third antennal joint long; fourth considerably longer than fifth,  
*morrisoni*, Cress., var. *flagellaris*, Ckll.  
Third antennal joint shorter; fourth scarcely longer than fifth,  
*morrisoni*, Cress.
10. Third antennal joint scarcely shorter than fourth; fifth about  
equal to third, . . . . . *luteoloides*, Rob.  
Third antennal joint very much shorter than fourth, . . . *luteola*, Lep.
11. Face square, tegulae yellow, . . . . . 12.  
Face broader than long, . . . . . 13.
12. Third submarginal cell very narrow; flagellum mostly dark,  
*sulphurata*, Smith.  
Third submarginal cell broad below; flagellum fulvous-red be-  
neath, . . . . . *citrina*, Cress., var.
13. Lateral face-marks receding from orbits above; end of flagellum  
black above, . . . . . *citrina*, Cress.  
Lateral face-marks following orbits to top of eye; end of flagellum  
not black above, . . . . . *civilis*, Cress.

The species of this group (*Xanthidium* and part of *Holonomada* of Robertson) are very variable, and in my preliminary examination of them I separated out several supposed species which I have now concluded to treat as varieties only.

***Nomada dentariæ* (Rob.).**

I have a male from southern Illinois, sent to me several years ago as *N. luteola* by Mr. Robertson. As it clearly possesses the characters assigned to *dentariæ* by Robertson, I assume it to be that insect.

***Nomada vincta*, Say.**

I have before me three specimens, all from Illinois, belonging to the Acad. Nat. Sciences Phila. The male is marked by Mr. Viereck: "mixed with *affabilis*; flagellum thicker than in *affabilis*." One of the females has the mesothorax red, with a very broad black stripe in the middle; the other has it black, with a red stripe on each side above the tegulae. The former specimen is marked by Mr. Viereck: "mixed with *luteola*." Robertson says that *N. vincta* is autumnal; Mr. Fowler's California "*vincta*," flying in May, is presumably another species.

**Nomada zebrata**, Cress.

The female varies a good deal in size, and looks much like *N. morisoni*. I have before me the following specimens: Beulah, N. M., 8,000 feet, August, 1902, 1 ♂; South Fork, Eagle Creek, White Mts., N. M., about 8,000 feet, August 16, 1 ♀, collected by C. H. T. Townsend; Colorado Springs, Colo. (*L. Bruner*, No. 26), 1 ♀. A female in Acad. Nat. Sci. Phila., marked "Col. Snow" (I suppose from Colorado), has precisely the colors of *N. vincta*, but from the broad scutellum and postscutellum, etc., I take it to be a form of *zebrata*, the two species being very closely allied.

**Nomada elrodi**, sp. n.

♂.—Length about 10 mm., moderately slender; head and thorax black, with rather abundant pubescence; short and grayish dorsally, snow-white and conspicuously plumose on face, cheeks, pleura, etc.; facial quadrangle broader than long, orbits not far from parallel; labrum, mandibles except tips, broad band beneath eyes extending a little beyond middle of posterior orbits as a narrow stripe, clypeus, supraclypeal mark (covered by silver-white hair), and lateral face-marks, lemon-yellow; lateral face-marks very broad, ending a short distance above level of antennæ, the end rounded and diverging from the orbital margin; scape swollen but not excessively so, yellow in front, reddish with two large black spots behind; flagellum reaching to metathorax, bright ferruginous, the first four or five joints largely black above; third antennal joint about half length of fourth, fourth considerably longer than fifth; lateral borders of mesothorax red; upper border of prothorax, tubercles, large transverse mark on pleura (almost concealed by white hair), and most of scutellum, yellow; post-scutellum black; metathorax with four reddish-yellow spots, the upper two on the enclosure; tegulæ honey-color; wings long, not far from clear, apex dusky, stigma bright ferruginous, nervures ferruginous on basal half and fuscous on apical half of wing; second submarginal cell little narrowed above, third large; basal nervure a moderate distance basad of transverse medial; legs red; a spot at base of anterior femora beneath, basal half of under side of middle femora, and a suffused band on hind femora beneath, black; abdomen light lemon-yellow; basal half of first segment black, the edge of the black wavy; apical margins of all the segments reddish, broadest and darkest on the first three; apex slightly notched; venter yellow with pale ferruginous (marginal) bands, first segment ferruginous marked with a broad black V.

*Hab.*—"Montana," one in Coll. of Acad. Nat. Sci. Phila. Named

after Prof. M. J. Elrod, the Montana naturalist. Another (with mesothorax entirely black) is from Cedar Bluffs, Neb. (*L. Bruner*, No. 30).

**Nomada sulphurata**, Smith.

This has been regarded as a synonym of *N. luteola*, but it appears to me to be a perfectly valid species. I thought at first that *N. luteoloides*, Rob., might be a synonym of it, but the males at least certainly appear to be different. Compared with *N. luteoloides*, the male of *N. sulphurata* has a larger thorax and broader abdomen; the pleura shows a large irregular yellow mark, and a yellow spot beneath the wings; the scutellum is all yellow, the lateral margins of the mesothorax are yellow, and the metathorax has yellow lateral marks. The scape is more swollen, there is a yellow spot in front of anterior ocellus, and the whole of the face below the level of antennæ is yellow. The hind margins of the ventral surface of abdomen are broadly pale ferruginous. The flagellum is denticulate or warted beneath on the fifth to seventh segments from the end. The female has the mesothorax black, usually but not always with reddish-yellow stripes. The material of *N. sulphurata* before me, consisting of 1 ♂, 5 ♀, was collected by Mr. Viereck at Edge Hill, Pa., the male May 23, the females April 28 and May 5, 1901.

**Nomada rivalis**, Cress.

A male marked "W. T." (Washington State), from Acad. Nat. Sci. Phila., is before me. A female, also marked "W. T.," looks as if it belonged with the male, but the basal nervure meets the transverse medial, and the specimen is referred to *N. citrina*.

**Nomada civilis**, Cress.

A male from the National Museum is labelled "Colo., 1871," and is apparently from the Baker collection. I thought this might prove to be the male of *N. morrisoni*, but a couple of females from Corvallis, Ore., June 3, 1899, are so much like the male that I can only refer them to the same species. The characters given in the table separate them from *morrisoni*.

**Nomada luteoloides**, Rob., and **N. luteola**, Lep.

A female from Georgia, sent to me by Mr. Fox as *N. luteola*, has the yellow of metathorax encroaching upon the enclosure, as Robertson states for *luteola*, but the proportions of the antennal joints agree with *luteoloides*. A male from Georgia, received with the female, has the flagellum slightly denticulate beneath, and the orbits yellow except at summit behind, so it ought to be *luteoloides*. Nevertheless, the denticulation is feeble, and the anterior tibiæ have a black mark behind;

the metathorax has four dull yellow spots. The band on first abdominal segment is ferruginous in the middle. This does not precisely agree with either of the forms Mr. Robertson gets in Illinois; it seems to fall between them. It does not agree with *N. sulphurata*, although that was described from Georgia. *N. luteola* was originally described from "Carolina," and I suspect that the Georgia specimens here described may truly represent that species, the Illinois insect of Robertson being different; but this is at present little better than a guess.

A female collected by Mr. Viereck at Clementon, N. J., May 22, 1898, is genuine *N. luteola* as understood by Robertson. A couple of males from Mr. Viereck, one marked Montgomery county, Pa., are referred to *N. luteola*. Two males in the National Museum belong to *N. luteoloides*; one is from "N. Ill." (*Belfrage*), the other from J. L. Zabriskie, Nyack, N. Y. A ♂ *luteoloides* is from Edge Hill, Pa., April 28, 1901 (*Viereck*).

***Nomada edwardsii*, Cress.**

Variable in size. Females from Corvallis, Oregon, May and June (*Cordley*), and Washington State (Coll. of Acad. Nat. Sci. Phila.) lack the two yellow stripes on disk of mesothorax. The stripes are present in a female from Silver Lake, Utah, July 14 (*H. Skinner*).

***Nomada xanthophila*, Ckll., var. *pecosensis* n. var. (n. sp.?).**

A female specimen was taken at the Kin Kale Ranch, Pecos, N. M., June 26, 1903, by Wilmatte P. Cockerell. It has a good deal of resemblance in color and markings to *N. suavis*, Cress., but it is by no means the same. I refer it to *xanthophila*, because it looks like that species and is from the same general region, but it differs from the type ♂ by the microscopically tessellate rather than punctured abdomen, the bright ferruginous stigma, the second submarginal cell conspicuously narrowed above; first joint of labial palpi considerably longer than the other three together, second considerably longer than the third and fourth together; third antennal joint conspicuously longer than fourth. Other characters, more likely to be merely sexual, are: Head rather abundantly hairy, though the face is almost bare; supraclypeal mark well-developed; scape yellow in front, otherwise ferruginous with a black mark behind; antennæ reaching scutellum; sides of metathorax with very large yellow patches; pleura with a very large transverse yellow patch, and a yellow spot beneath the wings, no ferruginous at all; hind coxæ yellow in front; base and apical margin of first abdominal segment black, the rest (a very broad band) yellow; no ferruginous on second segment. The eyes are sage-green. From *N. superba* this

differs by being smaller, the basal nervure very little basad of the transverse medial, scutellum much less bilobate, mesothorax with only very short inconspicuous hair, outer side of third submarginal cell curved instead of angled, labial palpi pale ferruginous (darker, first joint almost black, in *superba*), etc. The *N. superba* compared is from S. Illinois (*Robertson*). The hump-like process seen on the sides of the metathorax in *superba* is barely indicated by a slight angularity in the Pecos insect. The length of the latter is about  $11\frac{1}{2}$  mm., and it is not so broad as *superba*. In *Robertson's* table of *Holonomada* the Pecos insect runs to *affabilis* and *vincta*, having the mesonotum coarsely punctured, nearly bare, flagellum red, its apical portion more or less suffused with blackish.

On the whole, I expect the Pecos bee to prove distinct from *N. xanthophila*, but as the two are so very much alike, and are known only by single examples of opposite sexes, I leave the female as a variety *pecosensis*.

**Nomada succincta**, Panz.

This is a *Xanthidium*, and looks much like our *N. sulphurata*. My examples are from Palma de Mallorca, Balearic Is. (*André*).

**Nomada citrina**, Cress.

I have before me three females from the Acad. Nat. Sciences Phila. One is from Washington State, without further data; the others are from Grangeville, Ida., "deposited by Wm. J. Fox." The Washington specimen is no doubt genuine *citrina*. The Idaho form has the face slightly narrower, and in one of them the head and thorax are red with yellow markings, the black being reduced to a few spots and patches. In this state the insect looks much like *N. morrisoni* or *zebrata*. In the Washington specimen the basal nervure meets the transverse medial; in the Idaho ones the basal is a trifle more basad. In *Cresson's* types (as I learn from Mr. Viereck) the basal nervure is from moderately to considerably basad of the transverse medial.

The red form from Idaho may be called *N. citrina* var. *rufula*. It has the antennæ entirely red, except that the scape is yellow in front; the front and vertex are bright red, except that the ocelli are on a black patch; mesothorax red, coarsely punctured, a little yellow in front of the tegulæ; scutellum with two large yellow spots separated by red; abdomen yellow with red bands, basal half of first segment red with four black or blackish spots; legs red and yellow, hind coxæ and femora heavily marked behind with black.

**Nomada morrisoni**, Cress.

Three females from the National Museum are from Colorado; two collected by Morrison, one marked "San Louis, Col., June 6, 1883.



Bruner." The last, I suppose from the San Luis Valley, is peculiar for having the nervure separating the first and second submarginal cells wholly wanting in both wings.

The var. *flagellaris* has the basal joints of the flagellum lengthened, as indicated in the table. It is possibly a distinct species. It is from Colorado (*Morrison*), in U. S. National Museum. It has the "anterior middle of mesothorax" red like the rest, not black. The yellow of the metathorax extends upward to form two large spots on the enclosure. The legs are without black, even on the coxæ.

**MELANOMADA**, subg. n.

Type *N. grindelia*, Ckll. The male, in Robertson's table, runs to *Holonomada*, but is entirely black, without yellow markings. Size small; *vertex and mesothorax smooth and shining*; apex of abdomen rounded, entire; basal nervure meeting transverso-cubital; antennæ short, third joint much longer than fourth, middle joints of flagellum much wider than long. Female unknown.<sup>1</sup> The type was taken at Lincoln, Neb., at flowers of *Grindelia*, in September. It is described in a paper sent to *Am. Mag. Nat. Hist.* A second specimen (Coll. of Acad. Nat. Sci. Phila.) is from Montana (no other particulars known); it is smaller (length about 6 mm.), with red mandibles and reddish stigma.

By the smooth mesothorax, *Melanomada* recalls the Mexican *N. limata*, Cresson.

**Nomada magnifica**, sp. n.

♀.—Length about 13½ mm., robust. "Colo., 1170, A. E. S. Coll., W. J. Fox," with Mr. Viereck's note, "mixed with *grandis*." I confess that I should have taken it for *grandis*, had not Mr. Viereck found it different. In true *N. grandis*, as I learn from Mr. Viereck, the basal nervure is a long distance basad of the transverso-medial, as in *superba*, *edwardsii* and *affabilis*; in *N. magnifica* the basal nervure meets the transverso-medial. The specimen of *magnifica* has the yellow parts wholly reddened by cyanide, but it seems to have been marked as in *grandis*; the abdomen was certainly yellow with the hind margins of the segments infuscated, and with the basal half of the first segment ferruginous, with a dusky spot on each side. Other particulars are: Apical part of mandibles black; mandibles simple, stout; head practically without black, area about ocelli blackish; antennæ entirely red, third joint longer than fourth; mesothorax coarsely and extremely

<sup>1</sup>Mr. J. C. Crawford writes that he has the ♀, and that it has a red abdomen.

densely punctured, with a blackish median band; scutellum prominent, apparently yellow, with very large punctures; enclosure of metathorax jet black, strongly contrasting with surrounding parts, having a well-defined little area of fine ridges on each side; tegulæ large, ferruginous, punctured; wings dusky, especially the apical margin very broadly; nervures brown; stigma small, ferruginous; second submarginal cell very broad, receiving the recurrent nervure less than a third of its width from the end; third submarginal cell rather narrow, with its outer side curved rather than bent; legs bright ferruginous.

The insect is evidently a *Holonomada*.

**Nomada excellens**, Ckll., var. *α*.

♀.—Lateral black stripes on mesothorax evanescent; red spots on metathorax larger; black spots at base of first abdominal segment evanescent.

*Hab.*—Nevada (no other particulars known); one in Coll. of Acad. Nat. Sci. Phila.

**Nomada erigeronis**, Rob.

♀.—Length about 11 mm., with a very broad abdomen. Has simple mandibles and large spines on front coxæ, and belongs to *Centrias*, of which it is the type species. The stigma is very small; second submarginal cell broad; basal nervure only just basad of transverso-medial. The specimen before me is from Nebraska (no other particulars known), in Coll. of Acad. Nat. Sci. Phila., where (as Mr. Viereck tells me) it was mixed with *N. belfragei*.

**Nomada latifrons**, Ckll., var. *α*.

♀.—Length about 9 mm.; the black ocellar area completely separated by red from the black area just above the antennæ.

*Hab.*—Nevada (no other particulars known); one in Coll. of Acad. Nat. Sci. Phila.

**Nomada vinnula**, Cress.

A new locality is Corvallis, Ore., June 1 to 10, several females (Cordley). The female is very near *N. edwardsii*, but has a broader face, pleura with only a yellow triangular mark, and mesothorax wholly black. I do not know how to separate the male from *edwardsii*, or it may be that all my males are *edwardsii*. Prof. Cordley took female *edwardsii* at Corvallis on April 3 and May 11.

**Nomada nigrocincta**, Smith.

Prof. Cordley took the female at Corvallis, Ore., June 3. The mandibles are simple, and the abdomen has distinct black bands. There is some yellow at the lower corners of face, and small inconspicuous

yellow spots on each extreme side of third and fourth abdominal segments. Third antennal joint considerably shorter than fourth.

In a paper sent to *Annals and Mag. of Nat. History*, I have described a number of red species of *Nomada* from Corvallis, Ore.; but have given no table for their separation. The following table separates the females seen from Corvallis, in which red is the preponderating color:

1. Mandibles bidentate; abdomen with yellow spots on second segment only, or none; third joint of antennæ as long as fourth; metathorax with a black median band, . . . . . 2.  
Mandibles simple, . . . . . 5.
2. Larger; abdomen dark red; third submarginal cell narrowed almost to a point above; first abdominal segment with a black mark on each side, . . . . . 3.  
Smaller; third submarginal cell not so much narrowed, . . . . . 4.
3. Second segment with no distinct yellow spots (May 28),  
*bella*, Cress., var.  
Second segment with distinct yellow spots (May 9),  
*bella*, Cress., var.
4. Abdomen shorter, dark red (April), . . . . . *rhodomelas*, Ckll.?  
Abdomen longer, light red (May), . . . . . *grayi*, Ckll.
5. Abdomen with black bands (June), . . . . . *nigrocincta*, Smith.  
Abdomen without black bands, . . . . . 6.
6. Abdomen with large yellow spots on second and third segments, more or less of a band on fourth, etc.; third antennal joint about equal with fourth; a little yellow at lower corners of face (May and June), . . . . . *lewisi*, Ckll.  
Abdomen with very small yellow spots or none, and no band, . . . . . 7.
7. Abdomen without yellow spots, . . . . . 8.  
Abdomen with yellow spots (4 or 6); yellow at lower corners of face; third antennal joint shorter than fourth, . . . . . 10.
8. Size larger, about 10 mm. long; third antennal joint almost as long as fourth; no yellow at corners of face; sides of abdomen with suffused black marks (April), . . . . . *clarkii*, Ckll.  
Size smaller, about 8 mm. long, . . . . . 9.
9. Yellow at lower corners of face; third antennal joint not more than half length of fourth; sides of abdomen inclined to be black-spotted (May, June), . . . . . *astori*, Ckll.  
No yellow at lower corners of face; third antennal joint at least as long as fourth; abdomen dark red, its sides without black marks (May), . . . . . *corvallisensis*, Ckll.
10. Base of abdomen with a black mark in middle, or black right across; third antennal joint not much shorter than fourth (May, June),  
*oregonica*, Ckll.  
Base of abdomen without a black mark in middle; third antennal joint much shorter than fourth (May, June), . . . . . *ultima*, Ckll.

*Nomada ultima taraxacella*, subsp. n.

♀.—Length 7 mm., red; similar to *ultima*, but face narrower; mesothorax red without any black stripes (three black stripes in *ultima*);

black marks on first abdominal segment evanescent. As in *ultima*, there is a black diamond-shaped mark on the metathorax. The width of the face seems to vary somewhat.

*Hab.*—Placita, N. M., at flowers of *Taraxacum taraxacum*, one, May 5, 1903 (*Cockerell*); Pecos, N. M., at flowers of *Fallugia acuminata* (*F. paradoxa acuminata*, Wooton), one, June 23 (*W. P. Cockerell*); near Viveash Ranch, N. M., 8,800 feet, at flowers of *Erigeron*, one, July 21 (*W. P. Cockerell*).

***Nomada americana*, Kirby.**

This species seems to have a very wide distribution; specimens in the National Museum are from Canada, Colorado (with numbers 2,076, 2,185), and Louisiana (with numbers 2,564, 2,567, 2,420). They appear to come from the Baker collection. Two in Coll. of Acad. Nat. Sci. Phila., are from North Carolina. I also have the species from So. Illinois (*Robertson*) and Baldwin, Kans., June (*Bridwell*). It appears from the Bakerian numbers that this species is taken in Colorado along with *N. scita*. Now *scita* has a spine on the anterior coxa, and is very near to *americana*, though undoubtedly distinct. I cannot help thinking it possible that the Colorado *americana* females, though to all appearances genuine *americana*, are actually females of *scita*.<sup>2</sup>

The male of *N. americana* is quite variable; if I had only a large Canadian specimen and one of the smallest from Louisiana, I should think them different species. The Louisiana males (21 examined) vary greatly in size. One male is from Indiana, with number 2,003.

***Nomada martinella*, sp. n.**

♀.—Length about 7 mm.; bright red. This was formerly supposed to be *N. incerta*=*americana*; but it differs in its smaller size; lighter color, especially of the thorax; mesothorax without a black band; face broader above; antennæ and legs entirely bright ferruginous red.

*Hab.*—Mesilla Park, N. M., April 9, at flowers of plum (*Cockerell*, 2,628). Named after my little son. Two specimens were taken. A supposed variety of the same species, somewhat larger (length about 8 mm.), with the second submarginal cell very much broader, and the tegulæ lighter and yellower and less punctured, was sent to me by Mr. Fox as *N. incerta*. It is from Colorado, and if its distinctive characters are constant it is presumably separable specifically. Possibly it is the true female of *N. scita*. A specimen from Sioux City, Neb. (*Bruner*, 29), is also referred to *N. martinella*; it has the second submarginal cell

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<sup>2</sup> However, I find two males of *N. americana dacotana* labelled "Colo. 2,076."

comparatively narrow, as in *martinella*, but it receives the recurrent nervure far beyond its middle (at its middle in *martinella* type); in size it nearly agrees with *martinella*; the first joint of the flagellum is not much shorter than the second, seen from the front, whereas in *martinella* type it is considerably shorter.

All these insects are very easily separated from *N. americana* by the clear red antennæ and thorax without a black stripe. At a glance they look like *N. ultima taraxacella*, but they are *Centrias*, with strongly punctured abdomen and spines on front coxæ. They have not the black diamond on the metathorax, which is seen in *taraxacella*.

**Nomada scitiformis, sp. n.**

♂.—Length about 9 mm.; black with yellow markings; legs red and black. Flagellum constructed and colored as in *N. scita*, of which I had supposed this a variety, until I saw the real *scita* from Colorado. *N. scitiformis* differs from *scita* thus: Somewhat larger; clypeus low, no supraclypeal mark, and lateral marks shorter, so that the black area below the antennæ is much larger; postscutellum entirely black; abdominal bands lemon-yellow; first segment with no band, but only a spot on each side; band on second segment very broad at sides, rapidly narrowing mesad, where it is interrupted; legs a darker duller red, with more black; hind femora mostly black.

*Hab.*—Corvallis, Ore., June 2 to 8 (*Cordley*). Sometimes the clypeus has only the anterior margin yellow; and sometimes the first abdominal segment has an interrupted band, while that on the second is narrowly continuous in the middle. Five specimens examined.

*N. scitiformis* and also *N. scita* belong to *Centrias*, having a spine on the anterior coxa. The anterior legs of the males of these and *N. americana* differ thus:

*N. scitiformis*: Spine black, fairly long; red of leg fairly bright.

*N. scita*: Spine pale red, slender and rather long, directed caudad; red of leg bright.

*N. americana*: Spine red, short; red of leg not so bright.

Aside from these characters, the males of *Centrias* (+*Nomadula*) are easily separated thus:

1. Hind femora distinctly arcuate; base of abdomen with much red,  
*americana*, Kirby.
2. Hind femora not arcuate; base of abdomen not red, . . . . . 2.
2. Antenna without a pale annulus (middle region of flagellum),  
*erigeronis*, Rob.
3. Antenna with a pale annulus, . . . . . 3.
3. Hind femora with much black; no supraclypeal mark,  
*scitiformis*, Ckll.
- Hind femora bright red; a supraclypeal mark, . . . *scita*, Cress.

The female *N. americana* is easily distinguished from the red species of *Gnathias* and *Nomada* s. str. by the strongly punctured abdomen: Kirby says nothing about this, and it is with some hesitation that I follow Robertson's identification of the species.

*N. articulata*, Smith (♂ from Brookings, S. Dak., June 8, 1891) has a long spine on the anterior coxa, and belongs to *Centrias*. The hind femora are arcuate, and the ground-color of the abdomen is mainly red. This specimen of *N. articulata* was identified by Mr. Fox, who gave it to me; but I find that it is not typical, and in fact Smith's description of *articulata* applies to the ordinary male of *americana*. Kirby, as understood by Robertson. Hence, if any one should wish to discard Kirby's name as of uncertain application, *articulata* will be the proper name of the insect. I do not believe that *valida*, Smith, which has priority of place, is applicable.

The South Dakota insect, just referred to, may be described thus:

***Nomada americana daootana* subsp. n.**

♂.—Length about  $9\frac{1}{2}$  mm.; mesothorax largely dark red, leaving a broad median black band; lower inner angle of second submarginal cell produced; abdomen light red with yellow bands; basal half of first segment, and apical portion more or less, black; first segment with a yellow band narrowly interrupted in middle; band on second segment greatly narrowed but continuous in middle.

*Hab.*—Brookings, S. D., June 8. Also two specimens with band on second segment interrupted, marked "Colo., 2,076," in National Museum. Also three males from Montana (Coll. of Acad. Nat. Sci. Phila.).

***Nomada rubicunda* (Oliv.).**

This is also a *Centrias*. I have before me six females collected by Mr. Viereck in New Jersey; one at Clementon, May 16, 1897, five at Riverton, April 29. The insect is easily distinguished from *americana* by the light bands on the apical half of the abdomen, these bands in the New Jersey form being creamy-white. The basal nervure is a little basad of the transverso-medial.

***Nomada* (*Heminomada*) *obliterata*, Cress.**

A female from Indiana (Nat. Mus.) bears the Bakerian number 2,003. The species goes west even to Montana, as shown by two males in Coll. of Acad. Nat. Sci. Phila.. One of them, very curiously, has a triangular areolet on both sides at the beginning of the first recurrent nervure.

The following species are small (all under 10 mm. long), with numerous clear-cut yellow or white bands on abdomen:

*Females.*

1. Legs with much yellow; clypeus yellow; metathorax all black,  
*formula*, Viereck.
- Legs red, . . . . . 2.
2. Markings yellow; punctures of mesothorax very coarse and dense  
(Las Vegas, N. M.), . . . *modesta*, Cress., var. *vegana*, Ckll.
- Markings cream-color; punctures of mesothorax well separated on  
a shining ground, . . . . . *vierecki*, Ckll.

*Males.*

1. Apical plate of abdomen conspicuously notched; legs red, . . . 2.  
Apical plate of abdomen rounded or truncate, with at most a feeble  
emargination, . . . . . 5.
2. Scape slender, . . . . . 3.  
Scape swollen, yellow in front, . . . . . 4.
3. Markings white, . . . . . *vierecki*, Ckll.  
Markings yellow, . . . . . *crucis*, Ckll.
4. Flagellum very long, entirely black above, denticulate; lateral face-  
marks narrow, . . . . . *fragilis*, Cress.  
Flagellum black above at base and  $2\frac{1}{2}$  joints before the last; lateral  
face-marks broad, . . . . . *scita*, Cress.
5. Legs red, . . . . . 6.  
Legs with much yellow, . . . . . 8.
6. Face covered with white hair; scape swollen, yellow in front,  
*sophiarum*, Ckll.
- Face practically bare; scape slender, . . . . . 7.
7. Abdomen broader; lateral spots, but no band, on third segment,  
*lippiæ*, Ckll.  
Abdomen narrower; a band on third segment, *neomexicana*, Ckll.
8. Supraclypeal mark present; metathorax with much yellow,  
*suavis*, Cress.  
No supraclypeal mark; metathorax all black, . . . *verecunda*, Cress.

*N. vierecki*, *crucis*, *sophiarum*, *lippiæ* and *neomexicana* have been described in a paper sent to *Annals and Mag. of Nat. History*. The *N. suavis* before me is a single example from California, from the National Museum. *N. fragilis* I recognize in a specimen which I collected at Pecos, N. M., June 21, 1903, at *Salix*. It is a *Xanthidium*, and is not allied to the other species in the above table. The third antennal joint is exceedingly short, and the basal nervure is a little basad of the transverso-medial.

Of *N. scita* I have before me five examples; one from Montana (Acad. Nat. Sci. Phila.), the others from Colorado, apparently from the Baker collection, bearing numbers 2,076 and 2,185 (National Museum).

Of *N. verecunda* I have before me five from Nevada (Coll. of

Acad. Nat. Sci. Phila.). They differ very much from one another, and I thought at first to separate two species, one larger, with the scape yellow in front, the other smaller, with the scape dark. I think, however, they are certainly all one species. The transverse medial nervure is basad of the basal; a peculiar character, shared (as I learn from Mr. Viereck) by *N. adducta*, *putnami*, *suavis*, *snowi* and *heiligbrodtii*.

**Nomada ruidosensis**, sp. n.

♂.—Length 7 mm.; in the above table it runs doubtfully to *N. fragilis*, with which I had confused it; it differs, however, as follows: Head narrower; facial quadrangle almost square, not broadened above; no supraclypeal mark; upper part of lateral face-marks narrower; scape little swollen, dull reddish-yellow in front; flagellum (long as in *fragilis*) more slender; third antennal joint, *seen from above*, very little shorter than fourth; a small yellow spot on pleura, but no yellow on scutellum; general tint of legs darker, the black more suffused; first abdominal segment entirely black; yellow band on second segment narrowly interrupted. The flagellum is not denticulate.

*Hab.*—Ruidoso creek, New Mexico (*E. O. Wooton*, No. 67).

Allied to *N. dentaria*, Rob., but much smaller. The basal nervure meets the transverso-medial, but a little on the basad side. The second submarginal cell is very broad above. The ventral surface of the abdomen is dark brown, with obscure markings.

**Nomada elegantula**, Ckll.

A new locality is Lewiston, Idaho, one in Coll. of Acad. Nat. Sci. Phila., "deposited by Wm. J. Fox."

The following species have bidentate mandibles, and belong to Robertson's genus *Gnathias*:

*Females.*

- |   |                          |
|---|--------------------------|
| 1. Abdomen without yellow spots, . . . . .  | 2.                       |
| Abdomen with yellow spots, . . . . .  | 4.                       |
| 2. Head and thorax dark; scape dark, with a red basal spot,   |                          |
| <i>perplexa</i> , Cress., var.  |                          |
| Head and thorax lighter; scape entirely red in front, . . . . .                                       | 3.                       |
| 3. Mesothorax and metathorax with a black median band (Louisiana), . . . . .                          | <i>louisiana</i> , Ckll. |
| Mesothorax and metathorax without a black median band (Nevada), . . . . .                             | <i>rhodalis</i> , Ckll.  |
| 4. Fifth abdominal segment with yellow spots, . . . . .   | 5.                       |
| Fifth abdominal segment without yellow spots, . . . . .   | 8.                       |
| 5. Lower anterior orbits yellowish; pygidium ovate; mesothorax commonly with three stripes, . . . . . | <i>ovata</i> (Rob.).     |



- Lower anterior orbits not yellowish; mesothorax with not more than one stripe, . . . . . 6.
6. Larger; 10 mm. long or over; red of abdomen quite bright, *bella*, Cress.  
Smaller; 8 or 9 mm. long, . . . . . 7.
7. Red of abdomen dark, . . . . . *cuneata* (Rob.).  
Red of abdomen light (Colorado), . . . . . *schwarzi*, Ckll.
8. Length over 10 mm.; abdomen rather long, . . . . . 9.  
Length under 10 mm., . . . . . 10.
9. General color darker (Pa., N. H.), . . . . . *bella*, Cress., var.  
General color lighter (Wash., Ore., B. C.), . . . . . *bella*, Cress., var.
10. Dark species; scape in front black or blackish, with red basal spot, *perplexa*, Cress.  
Scape in front red, . . . . . 11.
11. Two submarginal cells, . . . . . *grayi eastonensis*, Ckll., var.  
Three submarginal cells, . . . . . 12.
12. Yellow spots on second abdominal segment small and inconspicuous, . . . . . 13.  
Yellow spots on second abdominal segment conspicuous, . . . . . 16.
13. Face very broad; orbits hardly converging below; third submarginal cell very high and narrow, but not much narrowed to marginal (Wash.), . . . . . *washingtoni*, Ckll.  
Face narrower; orbits conspicuously converging below, . . . . . 14.
14. Third submarginal cell narrowed nearly or quite to a point above, broad below (Wash.), . . . . . *grayi eastonensis*, Ckll.  
Third submarginal cell not thus narrowed above, . . . . . 15.
15. Abdomen long, light red; only a little black at base of first segment, . . . . . *grayi*, Ckll.  
Abdomen shorter, broader and darker; much more black at base of first segment (Oregon), . . . . . *rhodomelas*, Ckll.?
16. Smaller and lighter (North Carolina), . . . . . *carolinæ*, Ckll.  
Larger and darker (N. H., Pa., Ind., Kans., Neb.), *cuneata* (Rob.).

#### Males.

1. Scutellum usually spotted with yellow; tegulæ more or less yellow, . . . . . 2.  
Scutellum black or red; tegulæ ferruginous, . . . . . 3.
2. Middle joints of antennæ not longer than wide, . . . . . *ovata* (Rob.).  
Middle joints of antennæ longer than wide (Texas), *lepidæ*, Cress.
3. Clypeus with only the anterior margin yellow, though often broadly, . . . . . 4.  
Clypeus all or with the greater part yellow, . . . . . 7.
4. Abdomen broad, very dark red, with two widely distant spots on second segment, and usually on third, . . . . . *perplexa*, Cress.  
Abdomen lighter, . . . . . 5.
5. Second submarginal cell receiving recurrent nervure beyond its middle; abdomen light red with four large yellow spots; scape black in front; second submarginal cell narrow (Oregon), *rhodomelas*, Ckll.

- Second submarginal cell receiving recurrent nervure before or at its middle, . . . . . 6.
6. Larger; yellow marks on second abdominal segment almost meeting in middle line, . . . . . *bella*, Cress.  
Smaller; yellow marks on second abdominal segment widely separated, . . . . . *cuneata* (Rob.).
7. Abdomen long and narrow, bright red, with very widely separated yellow spots on second and third segments; second submarginal cell receiving recurrent nervure a little beyond its middle; scape red tinged with yellow in front; second submarginal cell broad (Nevada), . . . . . *physura*, Ckll.  
Not so, . . . . . 8.
8. Rocky Mountain species; mesothorax with more or less red; lateral margins of metathoracic enclosure curved inward; third antennal joint on upper side at least as long as fourth; no black spots on red part of first abdominal segment, . . . . . 9.  
Species of the country east of the Rocky Mountains, going west in the north to Washington State; mesothorax rarely with any red, when with red, lateral margins of metathoracic enclosure practically straight, . . . . . 10.
9. Third antennal joint short; second submarginal cell narrowed above, and receiving the recurrent nervure at or before its middle (New Mexico), . . . . . *schwarzi contractula*, Ckll.  
Third antennal joint longer; second submarginal cell broader above, and receiving the recurrent nervure beyond its middle (Colorado), . . . . . *schwarzi*, Ckll.
10. Mesothorax largely red (Lehigh Gap, Pa.), . . . . . *perplexa*, Cress., var.  
Mesothorax black, . . . . . 11.
11. Size largest; length nearly 10 mm.; eyes usually pale; abdomen usually with well-developed yellow bands, . . . . . *bella*, Cress.  
Size medium; length little over 7 mm., sometimes smaller, . . . . . 12.  
Size smallest; length about 6 mm. or less, . . . . . *cuneata* (Rob.).
12. Scape light red in front; spots on light part of first abdominal segment practically obsolete; scutellum largely red (New York), . . . . . *cuneata* var.?  
Scape black or dark red in front, . . . . . 13.
13. Scape black in front; eyes gray; scutellum black; abdomen with cream-colored bands, . . . . . *albofasciata*, Smith.  
Eyes black or nearly so; scutellum black or red; two black spots on first abdominal segment distinct (Wisconsin), . . . . . *cuneata* var.?

**Nomada lepida**, Cresson.

♂.—Length  $7\frac{1}{2}$ – $8\frac{1}{2}$  mm.; head and thorax black, with abundant hair, white except on vertex and dorsum of thorax, where it is tinted with brownish-gray, so as to appear dirty; facial quadrangle longer than broad; labrum, basal part of mandibles, clypeus (but no supraclypeal mark), and narrow lateral face-marks extending to level of antennæ, lemon-yellow; posterior orbits with a narrow yellow line extending

about half-way up; scape scarcely swollen, dull yellow and striato-punctate in front; flagellum rather dark ferruginous, the basal half more or less black above; third antennal joint shorter than fourth; thorax very densely punctured; narrow stripe on upper margin of prothorax, tubercles, round spot (not conspicuous) on anterior part of pleura (sometimes absent), and two oval spots on scutellum (which may be absent or represented by very small reddish-yellow spots), all yellow; an orange stripe on postscutellum, and an orange dot at each anterior corner of scutellum, may be well-developed or practically obsolete; tegulae more or less pale yellow; wings clear, dusky at apex, nervures dark brown, stigma dark ferruginous; second and third submarginal cells equally broad above, or the second may be somewhat broader; basal nervure a considerable distance basad of transversomedial; legs pale ferruginous, with yellow knees and yellow stripes on the tibiae; most of coxae, base of middle femora, and hind femora except apex, black; abdomen dark brown with six bright yellow bands, that on second segment very broad, and not much narrowed in the middle, that on fourth inclined to be narrowly interrupted; apex bidentate; venter dark reddish marked with yellow.

*Hab.*—Round Mountain, Tex., three in Coll. of Acad. Nat. Sci. Phila. Collector unknown. Also two from Colorado (Baker collection, No. 1,871), in the National Museum. The species has been recorded from Rock Island, Ill., and Berkeley, Cal., but possibly the specimens from the latter locality may be wrongly determined.

Mr. Viereck very kindly went over the whole Cresson collection to see if there were any species of *Gnathias* not recognized as such by me. He found only *N. lepida*; *N. amæna* was not in the collection, and could not be examined. I had described *N. lepida* as new, and it is only Mr. Viereck's reference of it to *Gnathias* that has enabled me to correct the error. I let my description stand, as it will probably be useful.

***Nomada grayi eastonensis*, subsp. n.**

♀.—Length about 8 mm.; red. Differs from *N. grayi* by the third submarginal cell narrowing to a point above, the anterior orbits diverging less above, and the greater amount of black at the base of the first abdominal segment. In the type specimen, and also in the type of *N. grayi*, the first ventral abdominal segment has a black mark resembling a fish-tail.

*Hab.*—One specimen, marked "Easton, Wash., K.," is in the National Museum. Another marked "W. T." in Coll. of Acad. Nat. Sci.

Phila. is referred to *eastonensis*, but is peculiar for having the nervure between the second and third submarginal cells wanting.

***Nomada rhodomelas*, sp. n.**

♂.—Length about 8 mm.; head and thorax black, extremely closely punctured; facial quadrangle nearly square; anterior margin of clypeus (failing in middle), labrum, base of mandibles, and very narrow lateral face-marks ending as a fine line scarcely as high as antennæ, all yellow; scape black; flagellum red, basal half black above; third antennal joint nearly as long as fourth; thorax entirely black except that the tubercles are coppery-red; pubescence of head and thorax abundant, dull white, about the same color throughout; legs red, basal half of anterior femora beneath, middle femora behind except apex, and hind femora at sides and beneath, black; tegulæ light ferruginous, shining; wings fairly clear, dusky at apex; nervures and stigma dark brown; second submarginal cell narrow, higher than broad; third about or nearly as broad above as second, but greatly broadened at base; basal nervure a fair distance basad of transverso-medial; abdomen narrow, light red; basal half of first segment black; hind margins of first and second segments narrowly blackened, especially at sides; second and third segments each with a pair of large light yellow spots, wide apart and not pointed mesad; apex with a shallow emargination; venter red, more or less clouded with blackish, and black at base.

*Hab.*—Corvallis, Ore., May 20, 1899 (*Cordley*). A female from Corvallis, April 15 (*Cordley*), is referred to *N. rhodomelas* with much hesitation. It is red, and agrees with *rhodomelas*, and differs from *grayi*, in having much black at the base of the first abdominal segment. The second submarginal cell is very different from that of *rhodomelas*, being greatly broadened at the base, not essentially different from that of *grayi*. The abdomen is oval, quite broad, with round yellow spots on the sides of the second segment. The region just above the antennæ is black.

***Nomada washingtoni*, sp. n.**

♀.—Length about 8½ mm.; a bright ferruginous species, superficially similar to *grayi*, but with a shorter, more shining abdomen. It differs also by its considerably broader face, the orbits hardly converging below, and the peculiar third submarginal cell, which is high and narrow, the outer side regularly curved. The wings are dusky, the stigma is dark, and the basal nervure is a long distance basad of the transverso-medial; antennæ wholly red, except that the scape has a black mark above; third joint very much shorter than fourth; middle of front with a large black patch; mesothorax with a median black

stripe, but that on metathorax merely indicated on lower part; abdomen very broad; hardly any black at base of first segment; second with a small round yellow spot on each side; first ventral segment with a suffused black fish-tail mark; legs red, middle and hind femora more or less black at base beneath; first joint of hind tarsi blackened.

*Hab.*—Washington State (further particulars unknown), one in Coll. of Acad. Nat. Sci. Phila.

***Nomada physura*, sp. n.**

♂.—Length 9 mm.; head and thorax black, very densely punctured, hairy, the dorsal hairs orange-ferruginous, the others white; facial quadrangle broader than long, especially above, the orbits conspicuously converging below; mandibles (except tips), labrum, clypeus, and lateral face-marks (narrow, and ending in a very fine point about level of antennæ), lemon-yellow; antennæ long, third joint considerably shorter than fourth; scape stout but hardly swollen, hairy, reddish-yellow in front and black behind; flagellum bright ferruginous, basal half blackish above; upper margin of prothorax, spot on anterior part of pleura, tubercles, tegulæ and scutellum, bright ferruginous; tegulæ strongly punctured; wings fairly clear, dusky at apex, nervures dark brown, stigma ferruginous; second and third submarginal cells broad; basal nervure a moderate distance basad of transverso-medial; legs bright red, coxæ largely black; front and middle femora at base beneath, and hind femora beneath and behind except apex, black; spurs light ferruginous; abdomen narrow-fusiform, bright red; basal half of first segment black; apical margin of first four segments very narrowly blackish; second and third segments with rounded lateral yellow spots, those on second much the largest; apical plate narrow, truncate, feebly notched; venter bright orange-ferruginous, with the base black and four narrow blackish transverse bands.

*Hab.*—"Nevada"; no other particulars known. One in Coll. Acad. Nat. Sci. Phila. It does not seem probable that this is the male of *N. rhodalis*.

***Nomada schwarzi*, sp. n.**

♂.—Length  $8\frac{1}{2}$  mm.; allied to *bella* and *cuneata*, but distinguished by the characters given in the table. Antennæ bright red, scape and first four joints of flagellum partly black above; mesothorax very coarsely punctured, with the lateral margins and two stripes on disk, dark dull red; scutellum and postscutellum rather bright red; pleura with a red spot in front, and dot beneath wings; tubercles, tegulæ and narrow upper border of prothorax red; legs red, blackened basally; wings clear, with clouded apex; stigma dark reddish-brown; basal

nervure a fair distance basad of transverso-medial; abdomen rather light red, nearly basal half of first segment black; large yellow marks on second and third segments elongated and pointed mesad; apical segments suffused with blackish; apex deeply emarginate; venter red, black at base, and with suffused blackish markings.

♀.—Length about 8 mm.; red; mesothorax with one black stripe; first abdominal segment with a pair of lateral black stripes diverging from the middle of the base, each deeply notched anteriorly; second submarginal cell very broad above. General characters much as ♀ *cuneata* (see table).

*Hab.*—Veta Pass, Colo., June 28, "collection C. V. Riley"; in National Museum. This, the type specimen, is a male. Two females in the National Museum are assigned here on the basis of probabilities; they are from the Baker collection, marked Colorado, number 1,871.

***Nomada schwarzi contractula*, subsp. n.**

♂.—Length 8 mm.; distinguished principally by the characters given in the table. The greater part of the mesothorax is red, and the pleura has a large transverse red patch. The abdomen is broad, dark red and distinctly punctured. Stigma dark; third submarginal cell with the outer bend low down; apical plate of abdomen only very feebly notched.

*Hab.*—Beulah, N. M., July, 1902. 1 ♂. (*Cockerell.*) Perhaps a distinct species.

***Nomada perplexa*, Cresson.**

Mr. Viereck has examined Cresson's types, and finds they represent a *Gnathias* 8 mm. long; the scape in front dark ferruginous to dark brown and blackish, pale ferruginous or yellowish-ferruginous at base; no yellow spots on fifth abdominal segment; basal nervure a considerable distance basad of transverso-medial; third antennal joint little or distinctly less than fourth. The species is a rather obscure but perfectly valid one. I have before me numerous specimens collected by Mr. Viereck, marked Lehigh Gap, Pa., males June 25 to 29, females July 1 to 21 (some of the latter collected by Mr. Rehn); Montgomery county, Pa., June 21, ♀; Castle Rock, Pa., July 18, 1901, ♀.

***Nomada rhodalis*, sp. n.**

♀.—Length about  $8\frac{1}{2}$  mm.; robust, abdomen broad-oval, shining; whole insect bright ferruginous, except a few black markings, viz., a stripe on prothorax, mark between wings and scutellum, and a spot in front of and above middle coxæ; no black at base of abdomen; palpi darkened, with conspicuous light rings at the sutures; face broad;

antennæ long, third joint scarcely shorter than fourth; tegulæ ferruginous, conspicuously punctured; wings dusky, especially at tips; second submarginal cell scarcely broader above than third; basal nervure a long distance basad of transverso-medial; nervures very dark; stigma small, ferruginous; first ventral segment of abdomen with a longitudinal black patch.

*Hab.*—Nevada (no details known). One in Coll. Acad. Nat. Sci. Phila.

**Nomada bella**, Cresson.

*N. bella* was based on the male; Robertson in 1902 stated that *N. maculata* was the female of the same species. So far as I am able to make out, this is correct; and Mr. Viereck, after examining Cresson's types, writes: "I think *bella* is very likely the other sex of *maculata*." As I have indicated in the table, the species presents some variation, which is partly geographical; but I am not at present able to distinguish more than one species in the material studied. It is curious that the females from the northwest, where one expects melanism, are paler than those from the northeastern States. *N. bella* flies from the latter part of April, through May, but apparently is over by June in most localities. In the series before me the males (*bella*, Cresson) are from Philadelphia, Pa. (Viereck); Riverton, N. J. (Viereck); Nyack, N. Y. (Zabriskie); New Hampshire (Baker collection, number 1,879); Polk county, Wis. (Baker); Michigan (Gillette); and Baldwin, Kans. (J. C. Bridwell). The females (*maculata*, Cresson) are from Franklinville, Pa. (Fox); Lehigh Gap, Pa. (Viereck); Indiana (Baker collection, numbers 1,876, 1,878); New Hampshire (Baker collection); Glenora, British Columbia (Wickham); Corvallis, Oreg. (Cordley); and Olympia, Wash. (Kincaid). It seems remarkable that a species found in Indiana and Kansas should fail to occur in Mr. Robertson's district in Illinois, but he has never met with it. This fact illustrates the danger of error in making broad statements about distribution. I find I have a single male collected by Prof. Kincaid at Seattle, Wash., June 25, 1897. This is much later than any of the dates on eastern specimens, but the insect appears to be a genuine *bella*.

**Nomada cuneata**, (Rob.).

In 1899 (*Entomologist*, p. 156) I commented on the geographical difference in size in the so-called *N. maculata*, and just before Robertson's recent paper appeared I had concluded that the small form ought to be separated. I am therefore very willing to recognize *N. cuneata* as valid. It does not always live apart from *N. bella* (*maculata*), but invades the territory of the latter in Kansas and Pennsylvania. *N.*

*cuneata* flies during April, May and the early part of June, its flight being coincident with that of *bella*. My latest date is June 5, Edge Hill, Pa. The localities represented are: Edge Hill, Pa., ♀ (Viereck); Ashbourne, Pa., ♂ (Viereck); Montgomery county, Pa., ♀ (Viereck); Lehigh Gap, Pa., ♀ (Viereck); New York State (Baker collection, ♀, No. 1,868; ♂, No. 2,168); Indiana (Baker collection, ♀, Nos. 2,002 and 2,040; ♂, No. 1,876); Illinois, ♂ (Robertson; sent years ago as *maculata*); Lincoln, Neb. (Bruner); Cedar Bluffs, Neb. (Bruner). Six males from Polk county, Wis., and one from New York State, all from the Baker collection, represent forms differing from *N. cuneata*, as is indicated in the table given above. They appear to constitute two geographical races, perhaps species; but as they are reddened by cyanide, and I have no females which belong to them, I leave them without names.

***Nomada albofasciata*, Smith.**

I have before me one male from Polk county, Wis. (Baker), and one from New York State (Baker coll., 2,168), both from the National Museum. The species was described from Canada. It is separable from *cuneata* by the bands of the abdomen being creamy-white instead of yellow, but it is extremely closely allied. When the abdomen is retracted, the bands on the third and following segments become partly or wholly hidden. The length of the insect is  $6\frac{1}{2}$  to 7 mm.

***Nomada louisianæ*, sp. n.**

♀.—Length 8 mm.; dark red; antennæ entirely red, third joint nearly as long as fourth; a short keel between antennæ; some black between ocelli and between antennæ; mesothorax with a single black band; metathorax with a black diamond; apical margin of wings strongly dusky; stigma dark reddish-brown, nervures fuscous; abdomen without spots or bands of yellow; four black spots at sides of base of first segment; pygidium shovel-shaped. Known from *N. cuneata* by its narrower, more cylindrical abdomen, and narrower face.

*Hab.*—Louisiana (Baker coll., No. 2,420), one in National Museum. With regard to the Bakerian numbers, it is well to state that they represent particular lots of specimens, captured at the same place, but not particular species. Hence different species often bear the same number.

***Nomada carolinæ*, sp. n.**

♀.—Length about  $7\frac{1}{2}$  mm.; red; region above antennæ, region about ocelli, broad band on mesothorax, broad band on metathorax, much of prothorax, and region between wings and middle and hind coxæ, all



black; cheeks black behind; abdomen long-oval, extreme base and more of sides of first segment black; second segment with large subpyriform (pointing mesad) yellow spots; spots on third segment present, but concealed by the retraction of the segment; antennæ wholly red, third segment almost as long as fourth; postscutellum dull orange; legs clear red, not blackened, except that the coxæ are largely black; general color of insect conspicuously lighter than in *N. cuneata*. Lateral black mesothoracic bands may be more or less indicated anteriorly.

*Hab.*—North Carolina, collector unknown. Two in Coll. of Acad. Nat. Sci. Phila. Perhaps only a race of *cuneata*, but obviously different in appearance from any in my large series of the latter, and also from a very different region.

The remaining species discussed in this paper have simple mandibles. The two following are comparatively large red and yellow species, superficially resembling *N. zebrata* and *N. vincta*.

***Nomada coloradensis*, sp. n.**

♀.—Length about 11 mm.; general build as in *zebrata*, except that the head and thorax are somewhat smaller; head, thorax and legs bright ferruginous without yellow, and with little black; abdomen ferruginous, sculptured as in *zebrata* but less closely, leaving the surface shining; first segment with black at extreme base, half-way along sides, and in basal sulcus, but no yellow; second and third segments with very large pyriform bright yellow marks pointed mesad; fourth segment with a yellow band, broadly emarginate in the middle anteriorly, and large lateral yellow spots; fifth segment with two yellow spots; venter ferruginous, immaculate. Labrum with a slight median longitudinal carina, and a small red tubercle on apical margin; facial quadrangle square; a very little black about ocelli and on inner side of antennal sockets; cheeks all red; antennæ entirely red, third and fourth joints subequal, flagellum robust; mesothorax very densely punctured, with no black band; metathorax with a black band, broken on apical part of enclosure; enclosure very large; sides of metathorax somewhat angled, not hairy (in *vincta* they are also bare, but in *zebrata* covered with pale golden hairs); tegulæ shining, rather sparsely punctured; wings strongly yellowish, stigma ferruginous, nervures ferruginous on basal half of wing, fuscous on apical; second submarginal cell very broad above, third with its outer margin bent almost to a right angle, its apex greatly narrowed; basal nervure a moderate distance basad of transverso-medial; hind tibiæ rough with black bristles; pygidium broad shovel-shaped.

*Hab.*—Colorado, bearing numbers 566 and 34; no further particulars

known to me. One in Coll. of Acad. Nat. Sci. Phila. I suspect that it came from Prof. Gillette.

**Nomada wheeleri**, sp. n.

♀.—Length  $9\frac{1}{2}$  mm.; robust, red, yellow and black; eyes purplish-gray; face slightly narrowed below; clypeus (except lateral spots), labrum, basal half of mandibles, anterior orbits broad below and extending more narrowly to top of eyes, and basal third of posterior orbits narrowly, all red; other parts of head black; front and vertex with very coarse punctures; labrum closely and coarsely punctured, with about four minute red denticles on middle of anterior margin; antennæ rather short, third joint longer than fourth; first three joints bright red, the rest darker, the apical half of the flagellum thickened and quite dusky; mesothorax with dense extremely large punctures, its color dull red, the anterior margin narrowly black, and a black median band on its posterior two-fifths; the prominent upper margin of prothorax, tubercles, the strongly bilobed scutellum except its median suture, and the postscutellum, yellow; pleura red with a yellow spot; metathorax entirely black, the enclosure short, the sides heavily bearded with yellowish-white hair; tegulæ red, large; wings nearly clear, dusky on apical margin, stigma small, ferruginous, nervures brown; second and third submarginal cells of equal breadth above, third scarcely angled outwardly; basal nervure meeting transverso-cubital; legs red, anterior coxæ with an apical point, hardly to be called a spine; abdomen closely and minutely but distinctly punctured; first segment red, clouded with black at base, and with two large transverse yellow marks; second red, almost covered by a dull yellow band which is very deeply and broadly emarginate in front; third yellow with the apical margin fuscous; fourth yellow, black at extreme base, and very narrowly fuscous on apical margin; fifth yellow; pygidium rounded at end; venter ferruginous, with a semilunar yellow mark on fourth segment.

*Hab.*—Texas (*Belfrage*). One in U. S. National Museum. Named after Prof. W. M. Wheeler, who has made such valuable contributions to the knowledge of Texan entomology. The densely (though very coarsely) punctured pleura, the markings of the face and abdomen, and the less robust form, distinguish this from *N. belfragei*, to which it is allied. The species belongs to *Micronomada* (syn. *Cephen*, Rob.), and it is also allied to *N. fervida*, Smith, which occurs in Florida and Georgia.

**Nomada lehighensis**, sp. n.

♀.—Length about  $7\frac{1}{2}$  mm.; ferruginous; area just above antennæ, region of ocelli, cheeks behind, anterior margin of mesothorax and three longitudinal bands (the lateral ones more or less evanescent), band on metathorax and broad band from wings to middle coxæ, all black; first segment of abdomen with lateral wedge-shaped blackish marks, but not black across the middle; second and third segments with distinct but small and round lateral yellow spots; fourth with sometimes four very small and indistinct yellow spots; fifth without yellow; venter ferruginous, darker in the middle, but immaculate. Mandibles simple; lower corners of face with a small yellow spot, not always evident; head broad, facial quadrangle a little broader than long; antennæ entirely ferruginous; fourth joint distinctly but not greatly longer than third, and a very little shorter than twelfth; tegulæ ferruginous, punctured; legs red, the basal parts suffused with blackish; wings rather dusky, especially on apical margin; stigma very dark ferruginous, nervures fuscous; second submarginal cell with its lower inner angle produced; basal nervure a short distance basad of transversomedial; pygidial plate with gently rounded sides, the apex subacute.

♂.—Similar to that of *N. sayi*, Rob.; but face broader; the slender scape ferruginous in front; third antennal joint nearly as long as fourth, which is shorter than in *sayi*; basal nervure very near to transversomedial (far basad of it in *sayi*); abdomen darker, with the yellow spots not pointed mesad; whole insect less slender.

*Hab.*—Lehigh Gap, Pa., July 1, 1897, ♀; July 11, 1900, ♀; July 21, 1902, ♀; June 29, 1901, ♀; June 25, 1901, ♀, ♂; June 30, 1901, ♂. Collected by Mr. Viereck. In one female the abdomen is without yellow spots; in another there is only one black band on the mesothorax.

*N. lehighensis* is a good deal like the Californian *N. atrofrenata*, Ckll., but among other differences the mesothorax of the latter is much more finely punctured. From the Oregonian *N. ultima*, Ckll., *N. lehighensis* is easily separated by its yellowish-red abdomen, with none of the coppery luster of *ultima*.

**Nomada sayi**, Rob.

I have an Illinois male from Mr. Robertson. Mr. Viereck has taken the species as follows: Clementon, N. J., June 2, 1901, ♀; Edge Hill, Pa., females, May 20, 1900, April 28 and May, 5, 1901; Philadelphia, Pa., June 22, 1899, ♀; Ashbourne, Pa., May 24, 1901, three males (all with scutellum red) and one female. It appears from these dates that *N. sayi* flies earlier than *N. lehighensis*.

**Nomada valida**, Smith.

♀.—Length 8 to 9 mm.; mandibles simple; abdomen dark chestnut-red, basal half of first segment black right across; second submarginal cell broad above; basal nervure a very little basad of transverso-medial, or sometimes a fair distance basad. I find the markings just as described by Smith, except that only the very narrow hind margin of the clypeus is black.

I recognize *N. valida* in three females from the Baker collection, in the National Museum. Two are labelled "Canada, 1872," and the other "New York, 1868." The scutellum is convex, bristly, but very slightly bilobed. The fourth antennal joint is a little longer than the third. The insect is evidently close to *N. simplex*, Rob., but it lacks the spots on the abdomen. *N. valida* is separated from *N. corvallisensis* by its larger size, distinct parapsidal grooves and dark bristles on scape; from *N. clarkii* by its much darker coloration, and smaller wings. It is, however, a close ally of *N. clarkii*, and when specimens have been collected right across the northern part of the continent, it may be necessary to reduce *clarkii* to subspecific rank.

A male marked "Canada, 1872," may belong to *valida*. It is 9½ mm. long; face silvery-hairy; clypeus, supraclypeal mark and rapidly narrowing lateral marks, yellow; scape rather stout, yellow tinged with red, flagellum entirely red; thorax very dark, but the bifid red marks on mesothorax are faintly indicated; very narrow hind margin of prothorax yellowish; scutellum and postscutellum mainly red; pleura with an obscure dull yellow spot, and a smaller and more obscure red one higher up; metathorax all black, with coarse vermiform rugæ at base; scutellum more prominent than in ♀, and with white instead of fuscous hairs; tegulæ pale yellowish-testaceous (deep red in ♀); third submarginal cell as broad above as second (narrower in ♀); basal nervure a fair distance basad of transverso-medial; abdomen ferruginous, basal half of first segment black; first segment with a rather narrow interrupted yellow band; second with a very broad yellow band, having only a linear median interruption; remaining segments with yellow bands, more or less notched behind laterally; apical plate deeply notched; venter dark ferruginous, with a large yellow spot at apex. The labrum is yellow, with a minute red denticle in the middle. The legs are red, the hind femora black beneath. The dentate labrum of this male allies it with *N. armata*, H.-S., which European species is said to occur, like *valida*, in Nova Scotia.

The large size of this male ("Canada, 1872") and the characters of the wings, tegulæ, metathorax, etc., make its identity with *valida* so

questionable that I believe least confusion will occur if it goes for the present under another name. It may be called *N. armatella*, sp. n.

There is a second species in Canada (Baker coll., No. 2,174, in National Museum) which I had at first confused with *N. armatella*; the male is about 10 mm. long, and differs from *armatella* thus:

<i>N. armatella</i> , sp. n.	<i>N. bethunei</i> , sp. n.
Denticle on labrum evident.	Denticle rudimentary.
Posterior orbits black.	Posterior orbits broadly red.
Front and vertex black; a red spot above each eye.	Front and vertex largely red.
<i>Scape cylindrical.</i>	<i>Scape swollen.</i>
Third antennal joint longer than broad.	Third joint broader than long.
Pleura with hardly any red.	Pleura with much red.
<i>Base of metathorax coarsely wrinkled.</i>	<i>Base of metathorax rugulose.</i>
Metathorax entirely black.	Metathorax with four red spots.
Basal nervure considerably basad of transverso-medial.	Basal nervure very little basad.
Yellow band on second abdominal segment with only a linear interruption.	Band broadly interrupted.
<i>Apical plate very narrow.</i>	<i>Apical plate very broad.</i>

The characters italicized are important; the others may not have specific value. *N. bethunei* is named after the Rev. C. J. S. Bethune.

Another species with a denticle on the labrum is *N. depressa*, Cresson, if I have correctly identified as such a specimen collected by Mr. Viereck at Lehigh Gap, Pa., June 30, 1897. It is a female, and has the large semilunar depression on the fifth abdominal segment as described in *depressa*. It is about 9 mm. long. The second transverso-cubital nervure is incomplete in both wings. An allied species, described below, occurs in Oregon.

Two males collected by Mr. Viereck at Philadelphia, Pa., May 2, 1897, have the mesothorax marked with dark red just as in *N. armatella*, and also possess a very rudimentary spine on the labrum, only visible because of its reddish color. I was almost ready to think these a varietal form of *armatella*, until I observed that they had bidentate mandibles, and belonged to *Gnathias*. As a matter of fact, they are a varietal form of *N. bella*, parallel to the variety of *N. perplexa* cited in the table of *Gnathias*. Typical *bella* also has a minute spine on the labrum, or rather a rudiment of a spine.

*Nomada volatilis*, Smith, described from Canada, is, I believe, a form of *N. bella*. We are not informed whether it has bidentate mandibles,

and I thought at first it might be *N. armatella*; but the following characters indicate *bella* rather than *armatella*: Supraclypeal mark absent; antennæ fulvous beneath (nothing said about yellow on scape); tegulæ ferruginous; abdominal bands interrupted; apical margins of ventral abdominal segments fusco-ferruginous.

***Nomada hoodiana*, sp. n.**

♀.—Length about 9 mm.; ferruginous-red, the color of the abdomen bright; facial quadrangle square; cheeks with the anterior half red and the posterior half black; a little blackish about bases of antennæ, sending lines downward to middle of sides of clypeus; ocelli on a small black patch; antennæ entirely red, except for a small black mark on scape above; third joint subequal with fourth; mesothorax with one black band; tubercles rather coppery, surrounded by black; enclosure of metathorax entirely red, minutely wrinkled at base; tegulæ yellowish-ferruginous; wings dusky along the veins; stigma dark reddish; second submarginal cell broad, third greatly narrowed above; basal nervure far basad of transverso-medial; legs red; first four femora with a black mark at base beneath; hind femora with much black suffusion beneath; abdomen of the comparatively long and narrow type; base of first segment black, with four reddish spots, the anterior edge of the black concave, and wavy in the middle; second segment with small and obscure suffused yellow lateral spots; fifth segment with a large semilunar velvety depression; pygidium very broad; venter red, a black fish-tail mark on basal segment.

*Hab.*—Mt. Hood, Ore.; collector unknown, (Coll. Acad. Nat. Sci. Phila.). The depression on the fifth segment is nearly twice as wide as in the Pennsylvania species I take for *N. depressa*.

The species in the following table all have the abdomen strongly punctured, the punctures round and distinct. They belong to *Micronomada* and *Centrias*. Those marked (D.) are placed from the description, specimens not being available:

*Females.*

Abdomen red, without light bands, . . . . .	1.
Abdomen with light bands, . . . . .	2.
1. Flagellum clear red, . . . . .	<i>martinella</i> , Ckll.
Flagellum strongly dusky, . . . . .	<i>americana</i> , Kirby,
2. Mesothorax red, basal half of abdomen at least largely red, . . . . .	3.
Mesothorax black, with little, if any, red, . . . . .	4.
3. Basal half of abdomen bright red; apical half with white bands, . . . . .	<i>rubicunda</i> , Oliv.
Abdomen heavily marked with yellow, the two halves not conspicuously different, . . . . .	<i>wheeleri</i> , Ckll.

4. Basal half of abdomen not red, . . . . . 5.  
First abdominal segment red; clypeus red, lateral face-marks  
white, . . . . . *snowii*, Cr. (D.).  
Abdomen red with white bands, . . . . . *ridingsii*, Cr. (D.).
5. Mesothorax with obscure reddish stripes; size large, abdomen very  
broad, . . . . . *erigeronis*, Rob.  
Mesothorax without any red; size smaller, abdomen not so  
broad, . . . . . 6.
6. Legs largely yellow; clypeus yellow, . . . . . *formula*, Viereck.  
Legs red, . . . . . 7.
7. Mesothorax with the punctures well separated, . . . . . 8.  
Mesothorax with the punctures extremely dense, . . . . . 9.
8. Markings creamy-white, . . . . . *vierecki*, Ckll.  
Markings lemon-yellow, . . . . . *putnami*, Cr. (D.).
9. Clypeus red, . . . . . *modesta* var. *vegana*, Ckll.  
Clypeus black, . . . . . 10.
10. Metathorax with yellow spots, . . . . . *modesta*, Cr.  
Metathorax without yellow spots, . . . . . 11.
11. Lateral face-marks white, . . . . . *heiligbrodtii*, Cr. (D.).  
Lateral face-marks yellow, . . . . . 12.
12. Punctures of mesothorax smaller, . . . . . *texana*, Cr.  
Punctures of mesothorax larger, . . . . . 13.
13. Flagellum black beneath, . . . . . *modesta* var. *river-tonensis*, Ckll.  
Flagellum red beneath, . . . . . *neomexicana*, Ckll.

#### Males.

- Apex of abdomen entire; supraclypeal mark surrounded by black,  
*lippiæ*, Ckll.
- Apex of abdomen notched, though sometimes feebly, . . . . . 1.
1. Flagellum with a light median area, on each side of which is  
black, . . . . . 2.  
Flagellum ordinary, not so colored, . . . . . 6.
  2. Tegulæ pale yellow or whitish, . . . . . 3.  
Tegulæ deep ferruginous, . . . . . 5.
  3. No supraclypeal mark, . . . . . *scitiformis*, Ckll.  
Supraclypeal mark present, . . . . . 4.
  4. First abdominal segment largely red, without light markings,  
*sophiarum*, Ckll.  
First abdominal segment black, with a narrowly interrupted cream-  
colored band, . . . . . *scita*, Cr.
  5. Ground color of abdomen nearly all red,  
*americana* var. *dacotana*, Ckll.  
Ground color of abdomen red basally, otherwise black,  
*americana*, Kirby.
  6. Metathorax with yellow spots, . . . . . *modesta*, Cr.  
Metathorax without yellow spots, . . . . . 7.
  7. Size larger; apex of abdomen very deeply emarginate; no supra-  
clypeal mark, . . . . . *crassula*, Ckll.  
Size smaller; apex of abdomen not so deeply emarginate, . . . . . 8.





except that the scape is slender, punctured and ferruginous; tegulæ ferruginous with a yellow spot; pleura black with an oval yellow mark on posterior part; yellow collar, tubercles, scutellum and postscutellum as in *modesta*; median depression of scutellum ferruginous; metathorax without yellow spots, its pubescence very short and conspicuously plumose; wings dusky, very dark at apex; stigma ferruginous, nervures rather pale fuscous; second submarginal cell very broad above; third narrow, its outer margin gently curved, greatly narrowed to marginal; basal nervure meeting transverso-medial; legs red; hind femora black behind and beneath except at extreme apex and base; hind tibiæ with a large yellow apical spot; hind coxæ black with a yellow mark; anterior coxæ black with a red apical spot, and long spines; abdomen black; apical half of first segment fuscous, with an entire yellow band, which is indented on each side in front; second segment with a broad yellow band; third and fourth with narrow bands, interrupted in the middle, and deeply indented (or interrupted) on each side posteriorly; fifth with a narrow yellow band, and lateral spots; apical plate broad, black, very deeply notched; venter entirely black.

*Hab.*—Louisiana, one (No. 2,563) in U. S. National Museum. The third antennal joint is longer than the fourth. The following Cressonian species have been examined by Mr. Viereck, and found to have, like *N. crassula*, the third joint longer than the fourth, and the basal nervure meeting transverso-cubital: *belfragei*, *zebrata*, *ridingsii*, *modesta*, *cubensis*, *krugii*, *tibialis*, *limata* and *scita*. The same is true also of *N. formula*.

#### NOMADULA, subg. n.

Type *N. americana*, "Kirby," Robertson, Ckll. Distinguished by the peculiar male antennæ, the two sexes quite differently colored, the strongly punctured abdomen, and the spined anterior coxæ. Includes *N. americana*, *N. martinella*, *N. scita*, *N. scitiformis*, *N. erythrochroa* and *N. sophiarum*. This is a compact group, quite distinct from *Centrias*, the type of which is *N. erigeronis*. *N. erythrochroa* is much like *martinella*, but larger, and with the abdomen much more finely punctured, and the eyes more converging below.

#### *Nomada sphærogaster*, sp. n.

♀.—Length about 8 mm.; black and yellow, with the legs largely red; form very broad (like *erigeronis*), the abdomen spherical seen from above. The general appearance is so like *N. crassula* that I thought at first it might be the female of that species; but this cannot be, as the anterior coxæ are not spined, and the punctures of the abdo-

men, though distinct, are merely little semilunar depressions. Head broad, facial quadrangle broader than long; scape and face with black bristles; cheeks entirely black, covered with grayish hair; mandibles except tips, labrum (which has a slight tubercle), clypeus except upper part, and a transverse flame-like mark coming from the lowest part of anterior orbital margin, yellowish-ferruginous; a minute red spot at the summit of each eye; antennæ rather long, third joint shorter than fourth; flagellum thick, dark reddish (the first joint brighter), as also is the scape; thorax rather abundantly clothed with dull grayish hair; mesothorax entirely black, extremely closely punctured; metathorax black, with two small yellow spots on the enclosure; scutellum with two large oval yellow spots; postscutellum black; pleura black; upper edge of prothorax, tubercles and tegulæ yellow; wings dusky, but not extremely dark, stigma and nervures rufo-fuscous; second submarginal cell broad above; third very broad below, its outer margin angled; basal nervure a short distance basad of transverso-medial; femora black, red at apex; tibiæ and tarsi red, the tibiæ more or less marked with yellow; abdomen black, with a broadly interrupted yellow band on first segment, a broad yellow band, not quite interrupted, on second, narrowly interrupted bands (more or less notched behind sublaterally) on third and fourth, and a large patch and lateral spots on fifth; pygidial plate very broadly rounded at end; venter black stained with red, especially on the second segment.

*Hab.*—Riverton, N. J., April 22 (*Viereck*). Mr. Viereck finds that the following Cressonian species have, like *N. sphærogaster*, the basal nervure a short distance basad of the transverso-medial, and the third antennal joint shorter than the fourth: *accepta*, *proxima*, *vicina*, *fragilis*, *dilucida*, *libata*, *parata*, *crotchii* and *crudelis*.

***Nomada electella*, sp. n.**

♀.—Length about 7 mm., proportions ordinary; black, yellow and red. Head and thorax bare, extremely coarsely rugose; head black, with the clypeus, supraclypeal mark, rounded lateral face-marks not going above level of clypeus, labrum (which has a strong reddish spine), mandibles except tips, and a minute dot at the summit of each eye, yellow stained with ferruginous; antennæ rather long, first three joints rufous, the others dark reddish-brown, third joint very much shorter than fourth; thorax black, the upper margin of prothorax, prominent tubercles, scutellum and broad transverse band on pleura, yellow, the last tinged with red; tegulæ testaceous with a yellow spot; wings dusky, stigma and nervures fuscous; second submarginal cell small and narrow, narrowed almost to a point above; third broad below, its

outer side angled; basal nervure a little basad of transverso-medial (in *electa*, I learn from Mr. Viereck, it is far basad, in the manner of *Gnathias*); legs yellowish-ferruginous; anterior coxæ with a short and blunt, but very distinct, spine; abdomen shining, with minute shallow punctures, first segment impunctate; first segment with a cloudy reddish band; second with a very broad yellow band, broadly interrupted in the middle; third with a narrower band, the middle third of which is wanting, and which is deeply incised sublaterally behind; fourth with a band which has only a linear median interruption, but sublaterally is so deeply incised in front as to be almost interrupted; fifth with a very broad band, deeply incised sublaterally in front; venter dark ferruginous clouded with lighter, most of the second segment light.

*Hab.*—Georgia, one in Coll. Acad. Nat. Sci. Phila., mixed with *N. electa*, Mr. Viereck informs me. By reason of the spined coxæ, it is allied to *N. denticulata*, Rob.

***Nomada robertsonella*, sp. n.**

♀.—Length  $7\frac{1}{2}$  mm.; bright ferruginous-red. This looks exactly like *N. erythræa* and *N. rhodosoma*; it differs from *erythræa* by having the abdomen without any coppery luster, the flagellum more slender, the third submarginal cell narrowed to a point above, and the second submarginal greatly produced at its lower inner angle. It differs from *N. rhodosoma* by having the third antennal joint only about half the length of the fourth, the third submarginal cell narrowed to a point above, and in the absence of a dark mark on the metathoracic enclosure. The basal nervure is a short distance basad of the transverso-medial; the first abdominal segment is without black, but has two faint dusky spots on each side of the basal half; the labrum has a distinct but small tubercle.

*Hab.*—Nevada, one in Coll. Acad. Nat. Sci. Phila., named after Mr. Charles Robertson. *N. rhodosoma*, Ckll., also occurs in Nevada; a single female from that State is in Coll. of Acad. Nat. Sci. Phila.

***Nomada rhodosoma* var. *rhodosomella*, var. nov.**

♀.—Smaller, length about 6 mm.; red color not so dark, more yellowish; hindmost third of mesothorax with a black band; a black stripe extending upward from region of middle coxæ; a black patch on each side of scutellum; no dark mark on metathoracic enclosure; tegulæ paler and yellower; abdomen more shining.

*Hab.*—Colorado (*Morrison*). One in National Museum. Perhaps a distinct species. I do not know the male of this form. The colors and

markings of the Californian male *N. rhodosoma* are rather suggestive of the European *N. flavoguttata* (Kirby); at least, the abdomens are extremely similar, though the slender dark legs, very dark antennæ, reduced face-markings, and small black tegulæ of *flavoguttata* are quite different from those of *rhodosoma*. My material of *flavoguttata* is from Mr. Friese.

***Nomada ruficornis*, (L.).**

A male sent by Mr. Viereck, from College Park, Md., April 10, 1898, is referred to this species, as it agrees with the description; but I have not been able to compare it with European specimens.

***Nomada cressonii*, Rob.**

In the National Museum is a male from Indiana, with the Bakerian number 1,876.

***Nomada kincaidiana*, sp. n.**

♀.—Length almost 9 mm, bright ferruginous. Much lighter, and with a narrower abdomen than *N. clarkii*; looks like *N. erythrochroa* or *N. rubrica*; differs from *erythrochroa* by its minutely roughened, slightly broader and darker abdomen; broader and less bilobed scutellum; broader face less narrowed below; black lines from antennæ to middle of sides of clypeus; smaller eyes; black patch before middle coxæ, and anterior coxæ without distinct spines. (In *erythrochroa* the anterior coxæ have very long spines.) The basal nervure is a moderate distance basad of the transverso-medial, while in *rubrica* they almost meet. The third and fourth antennal joints are both considerably shorter than in *rubrica*.

*Hab.*—Washington State, one in Coll. of Acad. Nat. Sci. Phila. Named after Prof. Trevor Kincaid.